

REFLECTIVE INSULATION

for commercial refrigeration

ALUMISEAL
VAPOR
BARRIER
SHEET.....

WOOD
SPACER
STRIPS.....

... ALUMISEAL SHEETS AS REQUIRED ...

RADIANT HEAT

95% - 97%
HEAT
REFLECTED

AIR SPACE AIR SPACE AIR SPACE

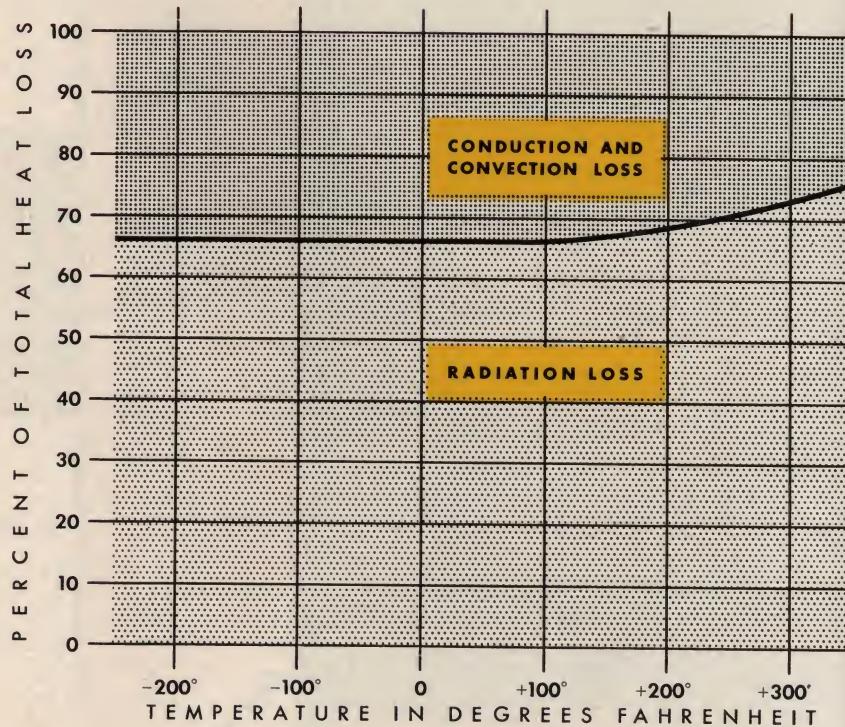


ALUMISEAL
U. S. PATENTS APPLIED FOR
REFLECTIVE INSULATION AND
VAPOR BARRIER MATERIALS

HEAT TRANSFERENCE RADIATION—CONVECTION—CONDUCTION

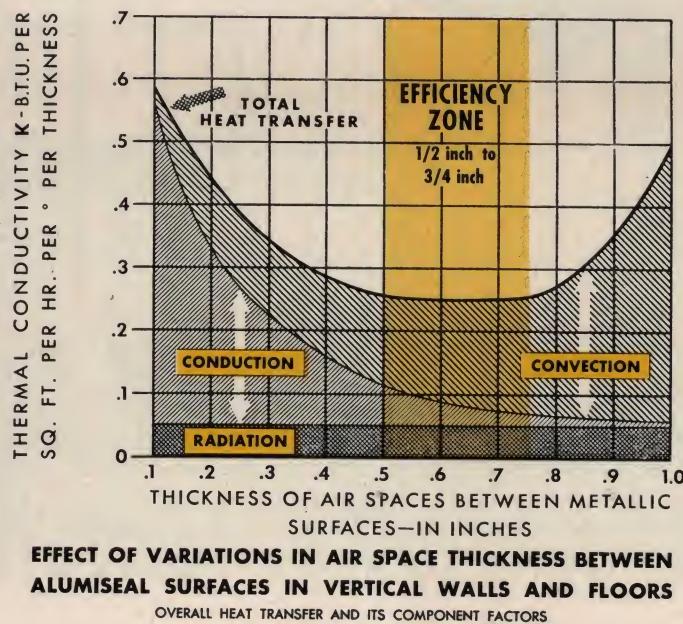
The results of tests at Mellon Institute of Industrial Research, Pittsburgh, Pa., in 1931 are graphically plotted in Chart 1. The radiation effect obviously dominates the picture. At high temperature radiation contributes over 85% of the heat loss and at low temperature never less than 66½%.

The results of an analysis of the relationship between air space thickness in vertical walls and floors and the three mediums of heat transfer are shown graphically in Chart 2. The radiation loss is constant. Conduction losses are high for thin air spaces and low for thick air spaces, while convection losses are just the opposite. The chart shows that the most efficient zone as far as insulating properties in walls and floors are concerned is a thickness of $\frac{1}{2}$ " to $\frac{3}{4}$ ".



HOW HEAT IS TRANSFERRED THROUGH AIR SPACE

CHART 1



EFFECT OF VARIATIONS IN AIR SPACE THICKNESS BETWEEN ALUMISEAL SURFACES IN VERTICAL WALLS AND FLOORS

OVERALL HEAT TRANSFER AND ITS COMPONENT FACTORS

CHART 2

RADIATION. As indicated in Chart 1, at least $\frac{2}{3}$ of the total heat crossing any air space is in the form of radiant heat. The Alumiseal sheets reflect 95% to 97% of this radiant heat.

CONVECTION. In vertical walls or in horizontal air spaces against heat flow upward, note that the $\frac{3}{4}$ " air spaces minimize the flow of convectional air currents.

CONDUCTION. The loss by conduction through $\frac{3}{4}$ " or larger air spaces is very slight. Heat conducted through the wood separator members naturally flows off into the Alumiseal sheets which are much better conductors than the wood separator strips; thus a finning action, as indicated by the arrows, occurs and the heat flowing into the Alumiseal sheets is retarded from crossing the next air space by the low emissive value and the high reflectivity of Alumiseal.

Alumiseal is a sheet aluminum of special alloy bearing the ALUMISEAL trade name. It reflects 95% to 97% of all radiant heat striking it on either side. ALUMISEAL is not a foil but a strong rigid sheet of aluminum alloyed with small amounts of other metals to increase strength and resistance to corrosion.

Alumiseal insulation works this way:

Heat energy is transferred through the air from its source in three ways... radiation, convection and conduction.

At ordinary temperatures radiation accounts for about $\frac{2}{3}$ of this total (See Chart 1 for relative proportions), of which 95% to 97% is stopped by ALUMISEAL's heat reflective properties. ALUMISEAL is equalled as a reflector of radiant heat only by such other materials as silver and rolled copper, both of which are commercially impractical because of high cost. Radiant heat is like a radio wave or light wave, in that it is electromagnetic energy and possesses a wave length. Like those waves it is subject to reflection. As light on a mirror is reflected and as radio waves bounce back to accomplish the phenomena of radar, so infra red (Radiant heat) waves bounce back when they strike ALUMISEAL creating a condition of heat protection or insulation.

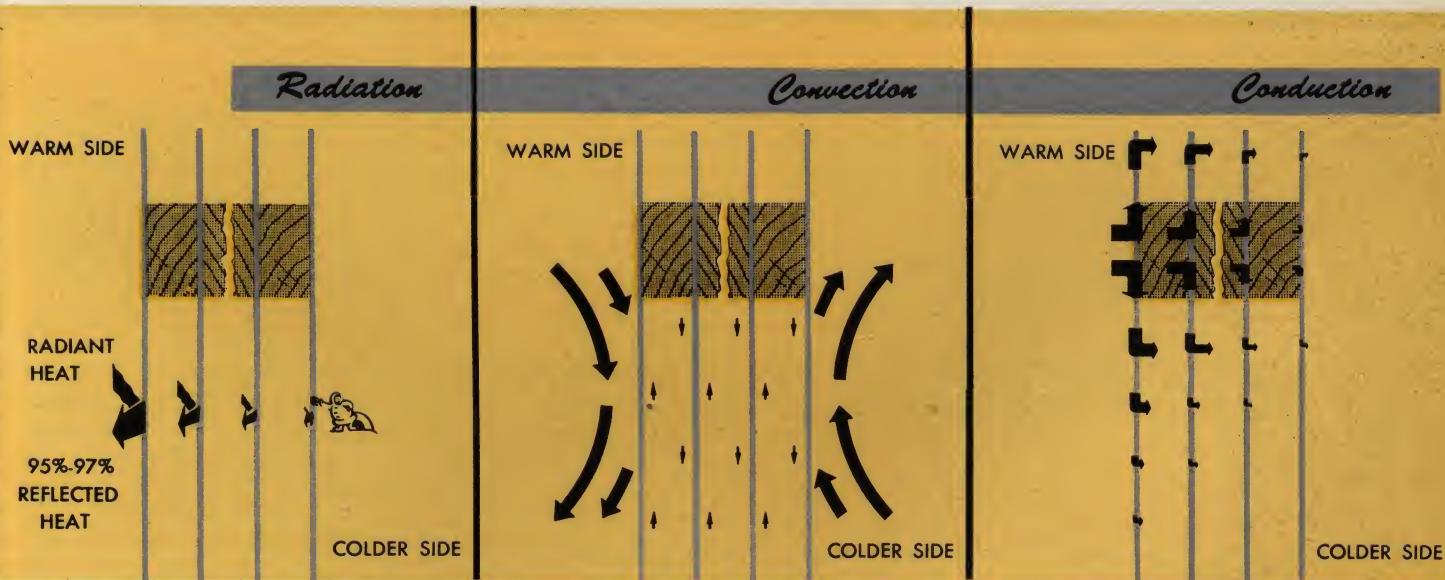
To reduce the passage of heat by means of convection and conduction, ALUMISEAL is installed so that heat seeking to enter the protected area must first cross an air space. If multiple layers of ALUMISEAL are used, air spaces are provided between successive sheets. Chart 2 shows that in walls and floors convection is reduced by narrowing the air space while conduction is reduced by widening the air space that heat must cross. Indicated upon the chart is the most efficient width, $\frac{1}{2}$ " to $\frac{3}{4}$ ", of air space to minimize both convection and conduction heat loss in walls and floors. This accounts for the Alumiseal standard in these locations— $\frac{1}{2}$ " to $\frac{3}{4}$ " spacing between sheets obtained by the use of wood separator strips.

Alumiseal insulating value. The ALUMISEAL sheets with adjacent air spaces, reduce to a very small degree, the heat that actually gets through to the protected area. The

value of an ALUMISEAL unit (a single sheet of Alumiseal with one adjoining $\frac{3}{4}$ " air space in a vertical wall with a temperature drop per air space of 15°F or less) established by leading authority is 0.23 B.T.U's per sq. ft. per hour per degree F at a mean temperature of 0°F and 0.29 B.T.U's per square foot per hour per degree F at a mean temperature of 50°F . This value is for a unit only $\frac{3}{4}$ " thickness yet it is equal to or substantially better than the values for 1" thicknesses of other long accepted standard materials in this field of application.

In horizontal air spaces where the flow of heat is downward as is the case in ceilings of refrigerated structures, the loss of heat through the air space by convection is practically nil because the air at the top of the space is warmer and lighter than the air at the bottom of the space. Consequently, the air is stratified and cannot rise or fall. Accordingly, the major loss through this air space is by conduction and radiation. Inasmuch as the highly reflective ALUMISEAL sheets eliminate the radiation loss, the resultant loss is that of conduction. The most effective and practical air space for use against this conduction loss is approximately $1\frac{1}{8}$ ". This dimension is used in ALUMISEAL construction in such horizontal locations where flow of heat is downward. It has been established by tests of the leading authorities of the nation, including the National Bureau of Standards, that one sheet of reflective insulation with a $1\frac{1}{8}$ " air space above and below the sheet is equivalent to approximately 3" of corkboard against a downward flow of heat. The established value of an ALUMISEAL unit against downward flow of heat (a single sheet of ALUMISEAL in a horizontal position with one adjoining $1\frac{1}{8}$ " air space) is 0.13 B.T.U's per square foot per hour per degree F at a mean temperature of 50°F .

It should be noted that the performance of ALUMISEAL is based upon principles entirely different from those involved in insulating by mass insulation materials. Having no heat reflecting properties, mass materials receive into themselves, by radiation, convection and conduction, all of the heat transferred through the outside air and rely upon a myriad of small air cells to slow down the conduction passage of heat into the protected area.



Alumiseal defeats insulation's greatest foe. As is well known, the infiltration of moisture into the insulation of a refrigerated space is the cause of topmost concern to refrigerating engineers, architects, contractors and owners. In short, vapor condensation is widely regarded as Insulation Enemy No. 1.

Vapor, just as heat itself, moves from areas of high temperature to those of low. The greater the temperature difference between the warm, humid air outside, and the cold air inside the room, the greater the "pressure" or "attraction" tending to force or draw this element into the room.

It is vital to most insulations definitely to prevent this flow. If it occurs in a "mass" material, it will eventually reach a dew point within the material and condense as water, filling up the air cells and rendering the insulation of little value. If it occurs in the insulation of a "freezer" room, the water will soon become ice, expand and cause further damage to the insulation and structure. An effective vapor seal is therefore a primary requisite when insulating a refrigerated space.

POSITIVE VAPOR BARRIER

RUST PROOF—PERMANENT

Alumiseal—the ideal vapor seal. Being solid metal, ALUMISEAL is impervious to vapor. Furthermore, any condensation of free water which occurs on the warm side of the vapor barrier sheet will not result in rust or harmful corrosion.

Since ALUMISEAL comes in long coils 32 in. wide, sheets may be cut to any desired length, resulting in a minimum amount of joints. These joints are made impervious to vapor passage with ALUMISEAL LEAD-SEALED, VAPOR-PROOF TAPE, which is backed with a powerful and permanent adhesive. The result is a complete, permanent envelope of solid sheet aluminum with sealed joints. This construction with ALUMISEAL sheets and ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE reduces moisture vapor permeability to less than 0.03 grams per sq. ft. per 24 hrs.

ALUMISEAL

U.S. PATENTS APPLIED FOR

Bars • • HEAT • • • COLD • • •

EASY HANDLING

CLEAN, HARD FINISH

Supplied in coils for installation. ALUMISEAL No. 34 B&S gauge (.006 in. thick) is supplied in coils (rolls) 16 in. wide and 32 in. wide. The 16 in. coil contains approximately 450 sq. ft. and weighs about 37½ lbs. The 32 in. coil contains approximately 900 sq. ft. and weighs about 75 lbs. These coils, easily handled by workmen, can be unrolled like wallpaper, cut into desired lengths by snips, scissors or knife, and applied with automatic staplers or nails at low cost.

Heavy gauge alumiseal. ALUMISEAL is also produced in No. 16 to No. 24 B&S gauge sheets, 3 or 4 ft. wide, and 8, 10, or 12 ft. long. These heavier sheets are recommended for use as the inside or outside surfaces of insulated rooms or cabinets where greater structural strength and rigidity are required. Such sheets, comparable in size to ordinary wallboards and applied to walls and ceilings, perform a dual function: first, as a layer of insulation; and second, as a quality interior room finish. Heavy gauge ALUMISEAL provides a lining of bank vault-like appearance pleasing because of its strength, fire protection, and obvious cleanliness.

The very small amount of vapor which can possibly enter a well-constructed barrier of this kind is so minute that dew-point, with resulting condensation, is not met within the insulated wall. Such small amounts of vapor are permitted to pass easily through the joints of the interior ALUMISEAL sheets which are purposely not sealed with ALUMISEAL TAPE to the interior of the cold room where they condense on the coils and are eventually eliminated through defrosting.

Sanitary—vermin proof—fire resistant.

ALUMISEAL is a clean hard-surfaced sheet which affords no home for germs. Obviously, vermin cannot gnaw their way through it, thus, perishable and valuable materials stored inside the refrigerator are given fullest protection. Likewise, being a strong heat reflective metal sheet, ALUMISEAL acts as a positive fire barrier.

Alumiseal cannot rust or rot. ALUMISEAL is the most durable material in the modern insulation field. Being solid aluminum, it cannot absorb moisture, oil or odors. Free water does not harm it. It is not attacked by rodents or vermin. It provides definite fire resistance. Installed as insulation inside the walls, floor or ceiling, ALUMISEAL will maintain its high efficiency as long as the structure lasts.

THE TREMENDOUS RESISTANCE TO CORROSION OF ALUMISEAL SHEET IS SHOWN ON THE ACCOMPANYING TABLE. SHEETS WERE EXPOSED TO THE ELEMENTS FOR A PERIOD OF 10 YEARS, IN VARIOUS LOCATIONS IN THE UNITED STATES. THE DEPTH OF ATTACK IN MILS IS SHOWN FOR EACH LOCATION. NOTE THAT THESE SHEETS WERE EXPOSED TO OUTDOOR CONDITIONS WHILE ALUMISEAL INSULATION IS USED INDOORS. DESPITE SUCH RIGOROUS TEST CONDITIONS, THE MOST SEVERE DEPTH OF PITTING ENCOUNTERED WAS NOT SUFFICIENT TO PIERCE EVEN THE THINNEST ALUMISEAL SHEET AFTER A 10-YEAR EXPOSURE PERIOD. ALUMISEAL WILL NOT WITHSTAND ACIDS OR ALKALINE ACTION BEYOND THAT LISTED IN PUBLISHED DATA OF THE ALUMINUM INDUSTRY.

SHEETS EXPOSED FOR 10 YEARS

IN VARIOUS LOCATIONS (ASTM TESTS)

LOCATION	DEPTH OF ATTACK
ALTOONA	0.7
STATE COLLEGE	0.
NEW YORK CITY	0.5
SANDY HOOK	0.
KEY WEST	0.1
PHOENIX	0.
LAJOLLA	4.0
AVERAGE	0.76

IN THOUSANDTHS OF AN INCH (ASTM TESTS)

VAPOR . . . FIRE . . . VERMIN . . . RODENTS . . . DIRT



Clean, hard, bank vault-like finish of heavy gauge ALUMISEAL.



Light, easy to handle ALUMISEAL coils.



Positive and permanent vapor barrier, effected with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE.



Easy application of ALUMISEAL coils on top of roof or floor slab.

ALUMISEAL INSTALLATIONS

COOLERS

FREEZERS

HOT ROOMS

for

MEAT

VEGETABLES

FRUIT

DAIRY
PRODUCTS

CONFETIONS

BEVERAGES

FURS

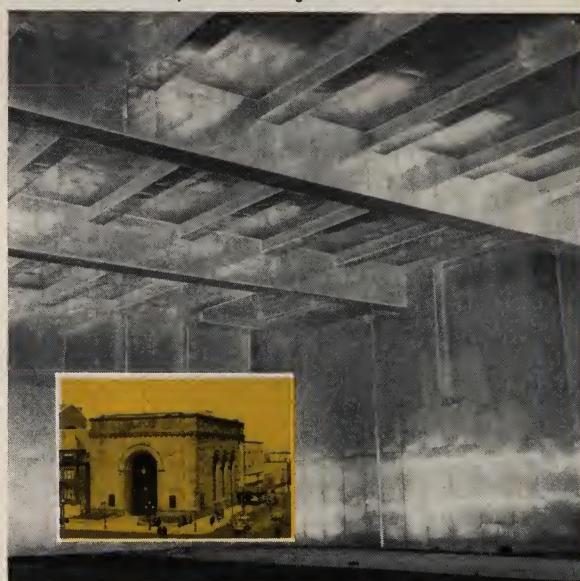
FLOWERS

AND
OTHER
PRODUCTS



L. A. Dreyfus Co., Oak Tree, New Jersey
A. D. Crosset Associates, Architects & Engineers

Chewing gum processing



Interior view of fur vault for the East New York Fur Storage Company located in East New York Savings Bank Building. Alfred H. Ryder, Architect

SPECIFICATIONS

INSULATION SHALL BE ALUMISEAL, SHEET ALUMINUM REFLECTIVE INSULATION, AS FURNISHED BY C. T. HOGAN & COMPANY, INC.

ALUMISEAL INSULATION SHEETS SHALL BE ALUMINUM, NOMINAL .006 INCHES IN THICKNESS, AND SHALL REFLECT 95% TO 97% OF RADIANT HEAT, AND HAVE A CORRESPONDING EMISSIVITY OF 0.03 TO 0.05.

THE NUMBER OF REFLECTIVE INSULATION SHEETS SHALL BE AS NOTED ON DRAWINGS FOR THE TEMPERATURE REQUIREMENTS AND SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF C. T. HOGAN & COMPANY, INC.

VAPOR BARRIER. THE HIGH TEMPERATURE SIDE OF THE INSULATION CONSTRUCTION SHALL BE PROTECTED BY ALUMISEAL SHEET. ALL JOINTS OF THIS REFLECTIVE INSULATION SHEET SHALL BE SEALED WITH ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE, AS FURNISHED BY C. T. HOGAN & COMPANY, INC.

HEAVY GAUGE FINISH. INTERIOR FINISH OF WALLS AND CEILINGS SHALL BE HEAVY GAUGE ALUMISEAL SHEETS HAVING THE SAME REFLECTIVITY AND EMISSIVITY AS SPECIFIED FOR REFLECTIVE INSULATION SHEETS.

GUARANTEE

THE NUMBER OF SHEETS OF ALUMISEAL INSULATION RECOMMENDED FOR VARIOUS TEMPERATURE DIFFERENCES AND THE METHODS OF APPLICATION SHOWN IN OUR CATALOGS, DRAWINGS, AND PUBLISHED DATA, ARE BASED UPON TEST BY RECOGNIZED LABORATORIES AND THE BEST ENGINEERING AND CONSTRUCTION PRACTICES AND EXPERIENCE DEVELOPED IN THE FIELD. THE ELEMENT OF GOOD WORKMANSHIP IN EXECUTING THESE RECOMMENDATIONS IS A REQUISITE FOR SATISFACTORY PERFORMANCE.

WE GUARANTEE THAT ALL ALUMISEAL INSULATION SUPPLIED BY C. T. HOGAN & COMPANY, INC., SHALL HAVE A REFLECTIVITY OF 95% TO 97% OF RADIANT HEAT WITH CORRESPONDING EMISSIVITY OF .03 TO .05.

(TESTS BY THE ALUMINUM INDUSTRY HAVE PROVED THAT THIS MATERIAL, IF NOT SUBJECT TO PHYSICAL OR CHEMICAL CONDITIONS AT VARIANCE WITH THE PUBLISHED DATA ON THE CORROSION-RESISTANCE OF ALUMINUM, WILL MAINTAIN A REFLECTIVITY OF NOT LESS THAN 90% AND AN EMISSIVITY OF NOT GREATER THAN .1 FOR A PERIOD OF 10 YEARS.)

NATIONAL BUREAU OF STANDARDS REPORT TIB-59,
FEBRUARY 5, 1938, STATES:

"TEST WAS MADE ON A SAMPLE OF ALUMINUM FOIL* WHICH HAD BEEN EXPOSED TO THE SUN, RAIN, WIND, AND INDUSTRIAL DUST ATMOSPHERE FOR TWO YEARS. IT WAS COVERED BY A GRAYISH BLACK DIRT DEPOSIT. THE REFLECTIVITY WAS FOUND TO BE 92% AS COMPARED WITH 97% FOR BRIGHT ALUMINUM FOIL. THE EMISSIVITY HAD INCREASED FROM 3% TO 8%. THIS CHANGE REPRESENTS COMPARATIVELY LITTLE DIFFERENCE IN THE INSULATING VALUE WHEN THE ALUMINUM FOIL IS USED WITH THE USUAL AIR SPACE."

*ALUMISEAL equals the highest reflectivity of aluminum foil and being solid sheet aluminum, is much stronger and more permanent.



Quincy Market Cold Storage & Warehouse Co. Watertown, Mass.
Largest minus 15°F frozen storage warehouse in the United States.
Ganteaume & McMullen, Architects and Engineers

Thinner walls—more pay space. ALUMISEAL walls are at least 25% thinner than equivalent mass insulation material.

For instance, those of a 4-layer cooler would be only 3 inches. And for such low temperatures as -70°F, less than 10 inches. This means that your containing structure can be smaller and less costly, or you can enjoy larger income-earning space.

Example: A room with outside dimensions approx. 30 ft. x 60 ft. x 10 ft. high, to be insulated for minus 10°F to minus 20°F.

Mass Insulation with "K" factor of 0.3 B.T.U.'s per sq. ft. per hr. per °F temp. difference required 8 in. thickness.

ALUMISEAL construction required 8 sheets - 6 in. thickness. Saving in insulation thickness—25%.

This means approximately 300 cu. ft. additional "pay" space; 30 sq. ft. additional floor space.

Alumiseal sheet requirements. Just as the different temperatures to be maintained within refrigerated space call for varying thicknesses of "mass" insulating materials, so ALUMISEAL is installed in units—each unit consisting of a sheet of ALUMISEAL and its adjoining air space.

The number of units of ALUMISEAL used in a refrigerated structure depends upon the difference between the temperature of the outside (ambient) air and the temperature to be maintained in the interior refrigerated space.

With outside temperature in the range of 80° to 85°F., the following number of sheets of ALUMISEAL are recommended for the various interior temperatures shown. These recommendations are based on tests by recognized laboratory sources and have been confirmed by actual performance in many field installations.

TEMPERATURE RANGE	NUMBER OF SHEETS OF ALUMISEAL REQUIRED			FLOORS	
	CEILINGS	WALLS	FLOORS		
SHEETS REQUIRED	B.T.U./SQ FT/HR/°F TEMP. DIFF.	SHEETS REQUIRED	B.T.U./SQ FT/HR/°F TEMP. DIFF.	SHEETS REQUIRED	B.T.U./SQ FT/HR/°F TEMP. DIFF.
PLUS 30°F TO PLUS 40°F	3 0.043	4 0.075	4 0.08		
PLUS 20°F	3 0.043	5 0.059	5 0.069		
0°F TO PLUS 10°F	4 0.032	6 0.049	6 0.064		
MINUS 10°F	5 0.025	7 0.04	7 0.057		
MINUS 20°F	6 0.021	8 0.032	8 0.052		

Lower temperature recommendations will be furnished upon request.

COMPARISON OF B.T.U. HEAT LEAKAGE INTO 0°F STORAGE INSULATED WITH ALUMISEAL AS COMPARED TO STANDARD MASS TYPES OF INSULATION

A 0°F storage 30 ft. x 60 ft. x 8 ft. high would, as noted above, be insulated with 6 sheets of ALUMISEAL in the walls and floors and 4 sheets of ALUMISEAL in the ceiling. The total B.T.U. leakage into this room would be:

CEILING—Approximately 57 B.T.U.'s per hr. per °F temperature difference.

WALLS—Approximately 69 B.T.U.'s per hr. per °F temperature difference.

FLOOR—Approximately 118 B.T.U.'s per hr. per °F temperature difference.

TOTAL—Approximately 244 B.T.U.'s per hr. per °F temperature difference.

This same space, insulated with 6 inches of standard mass type insulation having a 0.3 B.T.U. per sq. ft. per hr. per °F per inch thickness "K" factor, would have a total B.T.U. leakage, for walls, floors and ceilings, of approximately 255 B.T.U.'s per hr. per °F temperature difference.

This represents approximately 5% more B.T.U. leakage through 6 inches of mass type insulation than occurs through 6 sheets of ALUMISEAL at 0°F.

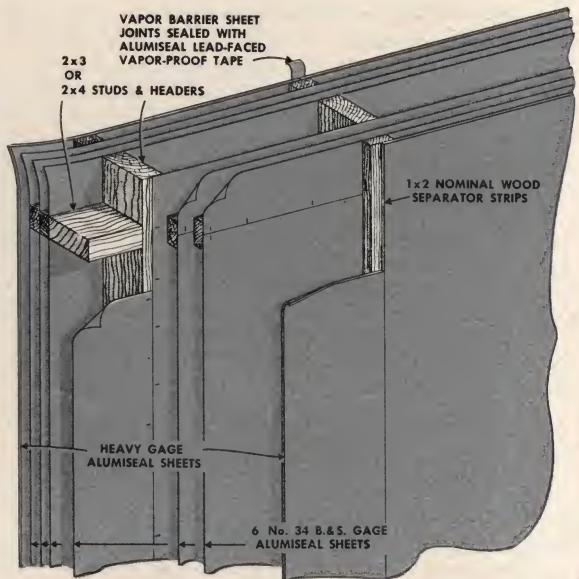
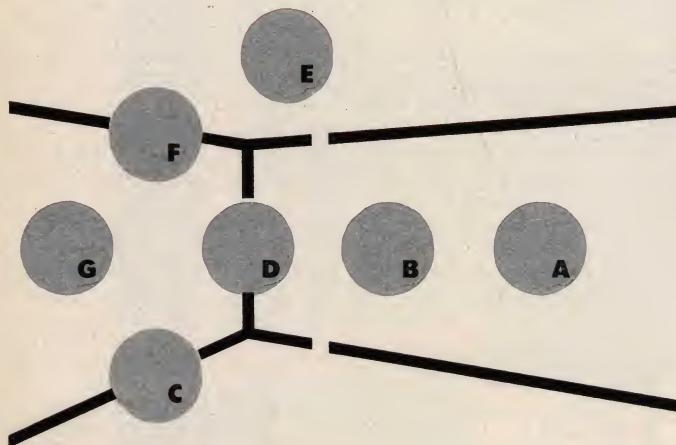


Fruit Dispatch Co. (United Fruit Co.). Banana storage and ripening rooms.

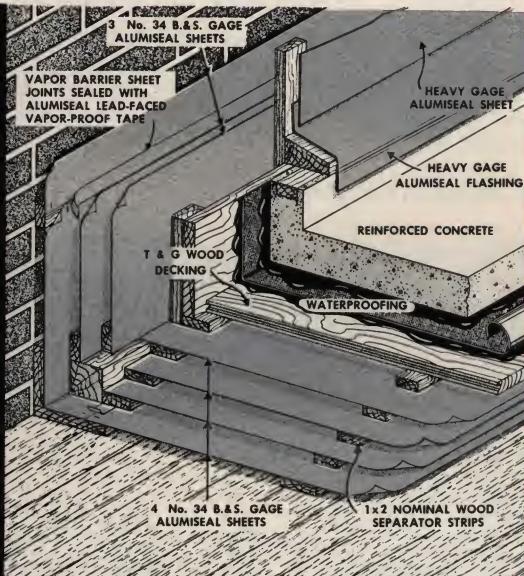


Beer Storage Ballantine's Ale. Portland, Maine

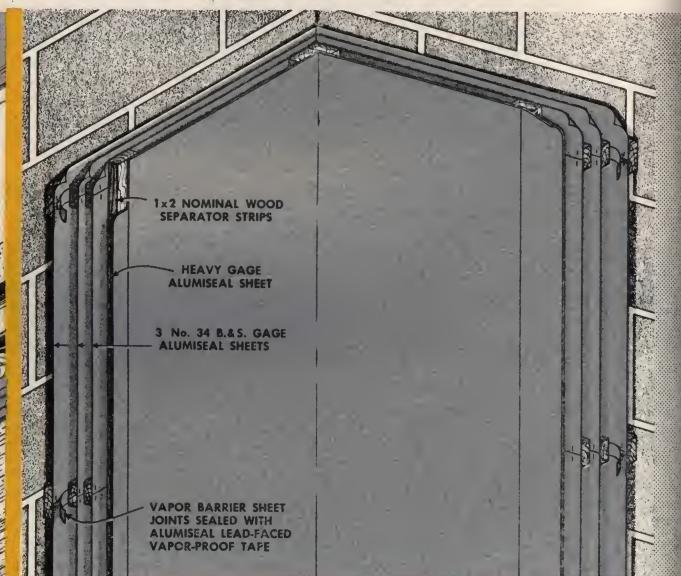
COOLERS—TYPICAL SECTIONS



A Free standing walls between coolers and freezers should, in most cases, be insulated with the same number of sheets as used in the exterior walls of the freezer. Operation of the freezer without the cooler is then possible and sweating of the cooler side of the partition is eliminated, unless excessive relative humidities occur in the cooler. Depending upon operational design, it is often advisable to seal both sides of the partition with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE.

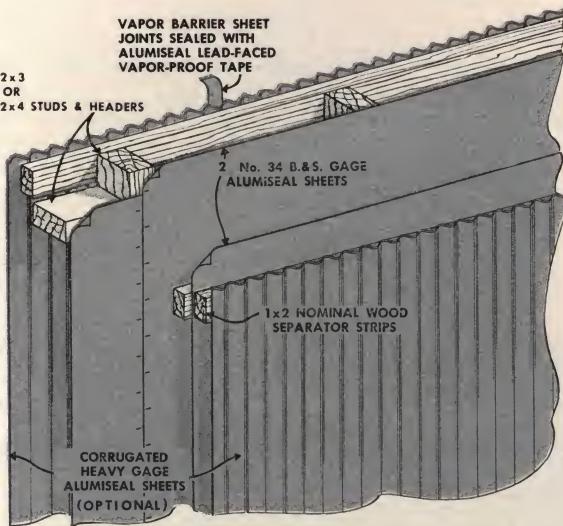


C The vapor barrier ALUMISEAL sheet with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE on all joints is continuous from wall to floor, forming a complete envelope. The 1 inch x 2 inch separators between ALUMISEAL sheets in the floor form a laminated or built-up bearing member 16 inches or 12 inches on centers. Wood decking, waterproofed on top, covers this construction and a reinforced concrete slab is poured on top of the wood decking. This reinforced slab distributes the floor load to the bearing members. ALUMISEAL floors can be designed for loads up to the crushing point of wood. The slab should be curbed up the wall and the heavy gauge ALUMISEAL wall finish is flashed over this concrete curb.



D Vapor barrier ALUMISEAL sheets with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE on all joints continues around intersections of walls. Subsequent ALUMISEAL sheets also continue around intersections, eliminating heavy wood construction at corners.

These details illustrate one typical application of Alumiseal in coolers for sections shown. For complete dimensioned details, ask for C. T. Hogan & Company, Inc. drawings, and specifications.



B Free standing cooler walls are generally built with 2 x 4 studs. These walls are strong, load-bearing constructions. Where space is at a premium and wall thinness is required, the 2 x 4 studs in the wall may be put in flat, thus taking up only a $1\frac{1}{2}$ inch thickness. The method illustrated above, taking up the full $3\frac{1}{2}$ inch stud thickness offers greater strength. The ALUMISEAL sheet on the warm side is sealed at all joints with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE. Illustrated above is corrugated heavy gauge ALUMISEAL finish which offers greater strength against physical abuse than does flat heavy gauge sheets. This corrugated sheet is furnished with $1\frac{1}{4}$ inch or $2\frac{1}{2}$ inch corrugations.

For more than a decade C. T. Hogan & Company, Inc., have specialized in engineering, design and construction, with reflective insulation, of insulated structures through the entire temperature range from 125 degrees below zero up to several hundred degrees above zero. The best materials have always been developed and featured in our specifications and recommendations. Accordingly, we have evolved ALUMISEAL with all the advantages of its aluminum alloy over the materials heretofore used in the reflective insulation field.

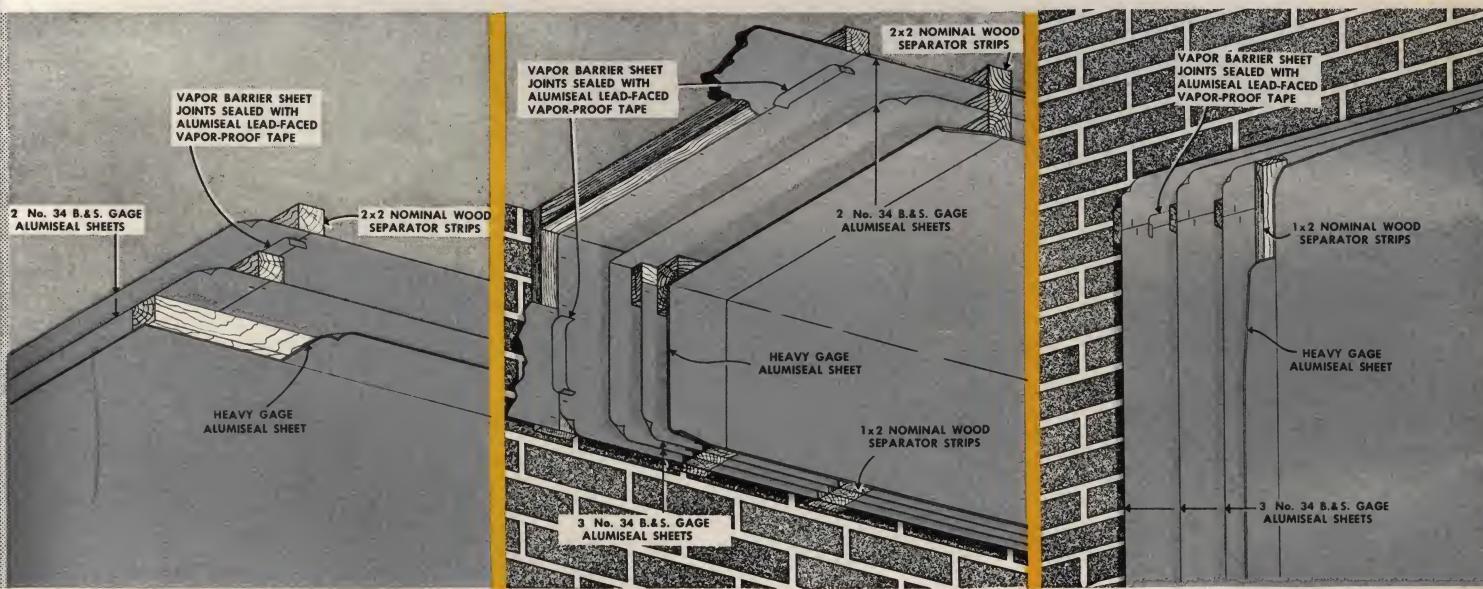
During the years of World War II, C. T. Hogan & Company, Inc. specialized in the design and construction of reflective insulation for the most severe low-temperatures of the Armed Forces and of Industry. Temperatures from minus 70°F to minus 125°F were maintained in altitude testing chambers, all-weather rooms, low-temperature test rooms, etc. The majority of such structures built for the Army and Navy Air Forces and for the Aviation Industry were part of our work.

The wealth of experience in the low-temperature field is now embraced in our recommendations, designs and constructions with ALUMISEAL. Laboratory tests are a continuing factor in our expanding activity.

● This combination of "know-how"—embracing years of experience in engineering, research and installation of reflective insulation—is necessary for achievement of the end purpose—to furnish you with an insulated structure of highest efficiency and permanence.

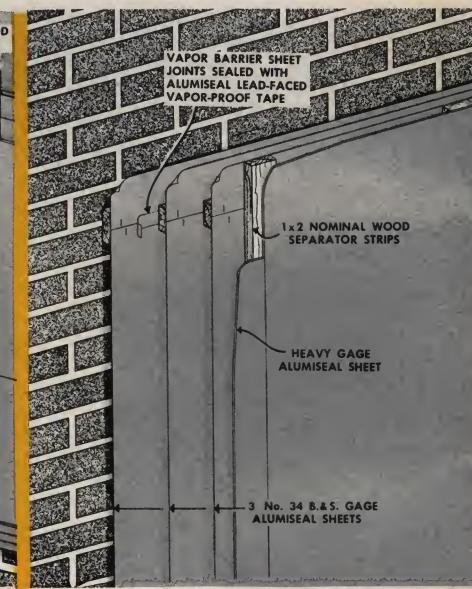
● ALUMISEAL means much more than a reflective sheet insulation. ALUMISEAL means a combination of the highly efficient, permanent materials described and the "know-how" of the experienced and competent organization of C. T. Hogan & Company, Inc.

The ALUMISEAL trade name on our product is your assurance of material meeting these described requirements.



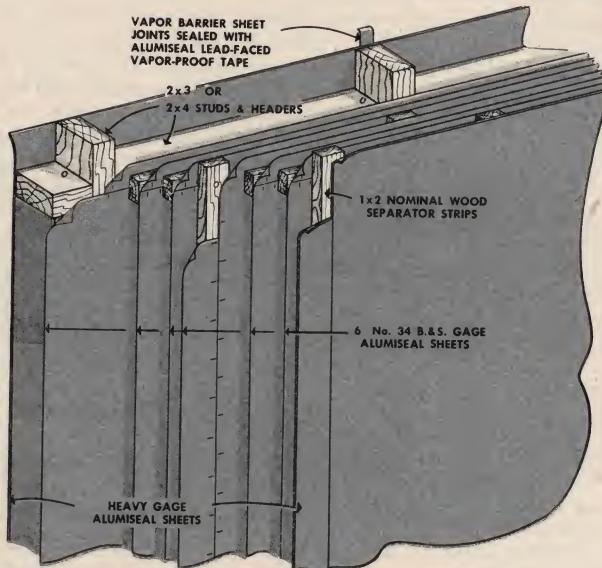
E Nominal 2 inch x 2 inch wood separators forming $1\frac{1}{2}$ inch air spaces are used in ceiling constructions where the flow of heat is downward. In this location, reflective insulation is at its maximum efficiency. As explained on pages 2 and 3, one sheet of ALUMISEAL forming two $1\frac{1}{2}$ inch air spaces can be equivalent to approximately 3 inches of corkboard against heat flow downward. In coolers where 4 sheets are used in walls and floors, only 3 sheets are recommended in ceilings.

F The ALUMISEAL vapor barrier sheet with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE covering all joints is continuous from wall to ceiling forming a complete envelope. Note that $\frac{3}{4}$ inch air spaces are used in the walls whereas $1\frac{1}{2}$ inch air spaces are used in the ceiling against heat flow downward.

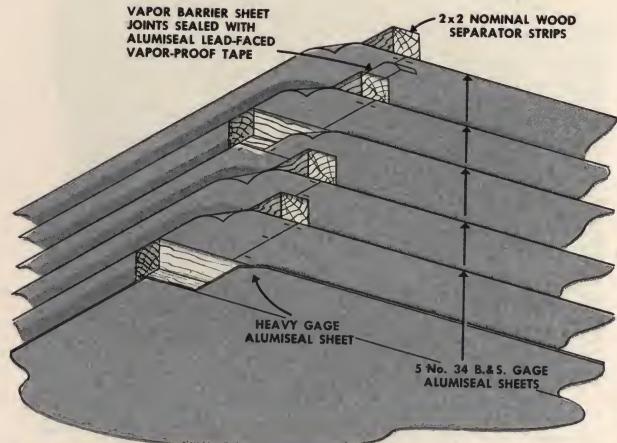


G Four sheets of ALUMISEAL with $\frac{3}{4}$ inch air spaces between sheets takes up only 3 inches overall space. This construction is equivalent to 4 inches thickness of standard mass type insulation.

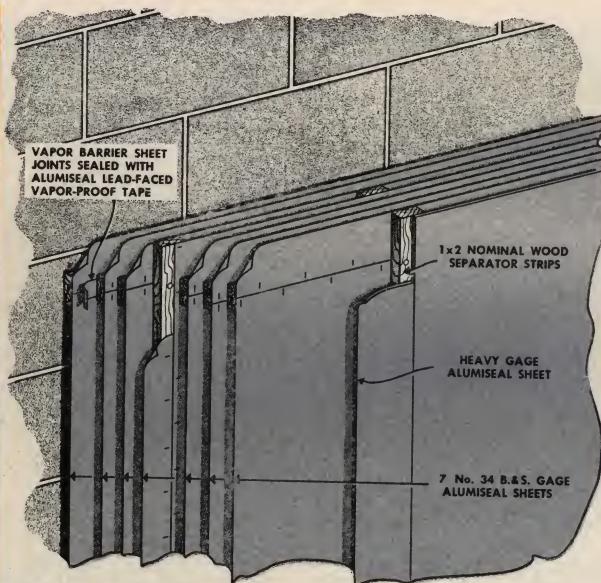
FREEZERS AND LOW TEMPERATURE TEST FACILITIES—TYPICAL SECTIONS



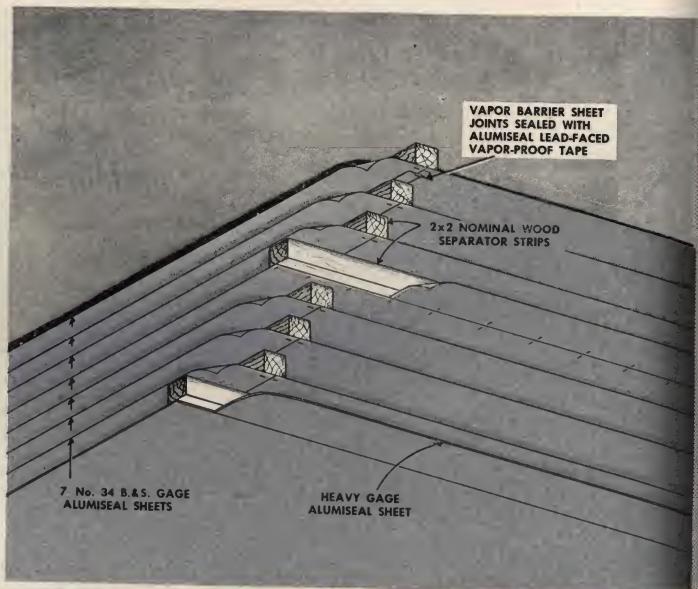
A Free standing freezer walls may be constructed with all of the No. 34 B & S Ga. ALUMISEAL sheets on one side of the 2 inch x 4 inch studs as shown above, or half of the total number of ALUMISEAL sheets may be applied on each side of the studs. Note that the wood separator strips are reversed in direction to eliminate "through wood conduction." ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE seals all joints of the warm side vapor barrier sheet.



B Freezer ceilings insulated with 6 sheets of ALUMISEAL spaced 1 1/8 inch apart have a "U" factor of 0.021 B.T.U's per sq. ft. per hr. per °F temperature difference equivalent to 14.5 inches of standard mass type insulations. The top or warm side vapor barrier sheet is continuous from ceiling to wall, sealed with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE, forming a complete vapor barrier envelope.



C Eight sheets of ALUMISEAL on masonry walls with sheets spaced 1/8 inch apart take up only 6 inches overall space. Yet this wall is equivalent to 9 inches thickness of standard mass type insulation. ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE seals all joints of the exterior or warm side vapor barrier sheet.



X Ceilings for minus 70°F to minus 100°F are insulated with 8 sheets of ALUMISEAL with 1/8 inch air spaces between sheets. This construction has a "U" factor of 0.016 B.T.U's per sq. ft. per hr. per °F temperature difference equivalent to 19 inches of standard mass type insulations. Note the reversal of direction of wood separator strips eliminating "through wood conduction." The ALUMISEAL vapor barrier sheet is sealed with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE at all joints. (See Note 1.)

The details A - B - C illustrate one typical application of Alumiseal, in Freezers, for sections shown. For complete, dimensioned details, ask for C. T. Hogan & Company, Inc. drawings and specifications.

The details X - Y - Z illustrate one typical application of Alumiseal (for sections shown) for temperature in the range of minus 70°F to minus 100°F as encountered in altitude chambers, all-weather rooms, wind tunnels and other low temperature test facilities. Detailed information and recommendations are available upon request.

The following installations were designed and constructed by C. T. Hogan & Company, Inc. during World War II. They illustrate the broad scope of our experience with reflective insulation in the extreme low-temperature field in the range of 100 degrees below zero.

LOW-TEMPERATURE ALTITUDE CHAMBERS

(minus 60°F to minus 100°F)

A.A.F.—Eglin Field—Proving Ground Command
A.A.F.—Orlando, Fla.—School of Applied Tactics
A.A.F.—Randolph Field—Aero-Medical School
A.A.F.—Wright Field—

Carburetor Test Chamber, Turret Chamber,
Armament Lab., Equipment Lab., Aero
Medical Lab., Radio Lab., Cabinet
Supercharger Chamber.

Army Proving Ground—Aberdeen, Md.
Bendix Aviation Corp.—(Eclipse Aviation Div.) Bendix,
New Jersey
Chance Vought—Stratford, Conn.
Ford Motor Company—Willow Run, Mich.
General Motors—(Allison Division)—Indianapolis, Ind.
N.A.C.A. Chamber—Langley Field, Va.
Naval Air Stations—Corpus Christi, Tex. (2); Jacksonville,
Fla.; Pensacola, Fla.; Opa Locka, Fla.
Naval Bureau of Aeronautics—San Diego, Cal.; Seattle,
Wash.; Norfolk, Va.

Naval Medical Center—Bethesda, Md.
Naval Research Lab.—Anacostia, D. C.
Pump Engineering Service Corp.—Cleveland, Ohio
Sperry Gyroscope Co.—Great Neck, L. I.
University of Pennsylvania—Medical School
Yale University, New Haven, Conn.

LOW-TEMPERATURE STATIC COLD ROOMS

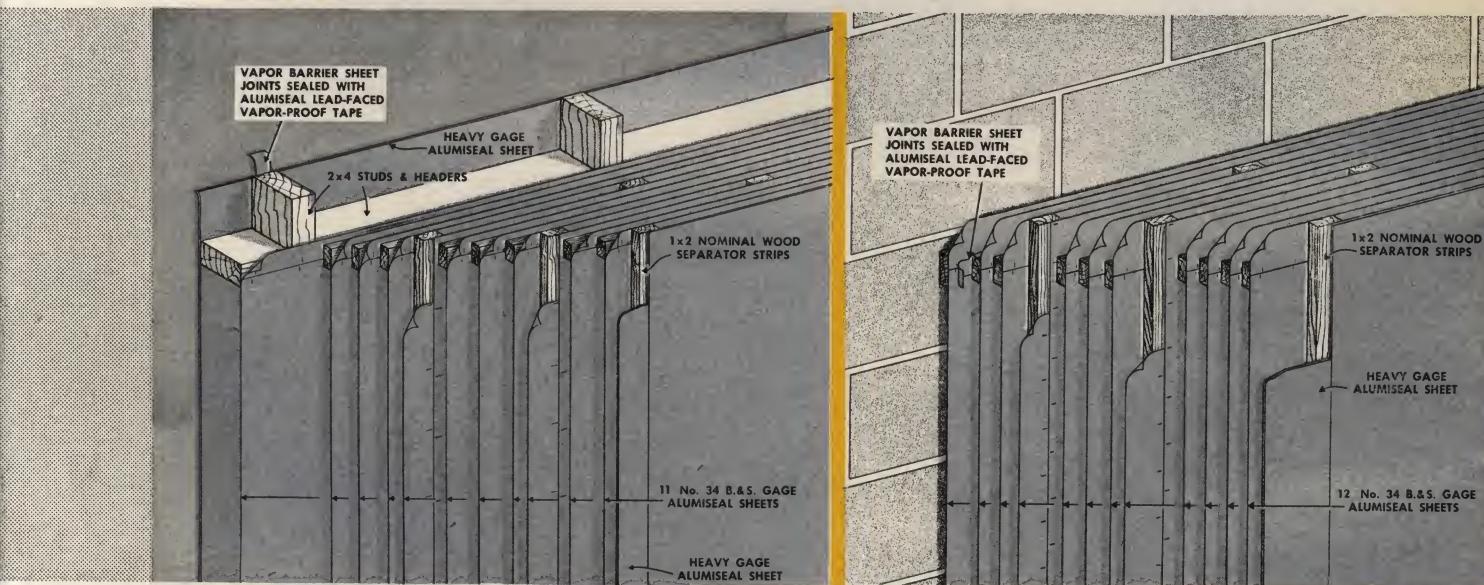
(minus 70°F to minus 100°F)

A.A.F. Triple Cell Room—Wright Field, Dayton, Ohio
Eastman Kodak Co.—Rochester, N. Y.
Mayo Clinic—Rochester, Minn.
National Research Council—Ottawa, Canada
Naval Aircraft Factory—Philadelphia, Pa.
Naval Torpedo Station—Newport, R. I.
Republic Aviation Corp.—Farmingdale, N. Y.
Vultee Aircraft Inc.—Vultee Field, Calif.

ALL-WEATHER ROOMS

(plus 165°F to minus 125°F with maximum humidity)

A.A.F.—Wright Field—Aircraft Radio Lab.; Aero Medical Lab.;
Fuel & Oil Test Lab.; Equipment Lab.
Fairchild Aviation Corp.—New York, N. Y.
Grumman Aircraft Corp.—Bethpage, N. Y.
Naval Research Lab.—Anacostia, D. C.
Western Electric Co.—Kearny, N. J.



Y Temperatures of minus 70°F to minus 100°F are adequately insulated with 13 sheets of ALUMISEAL in walls and floors. Note that the reversal of direction of wood separator strips eliminates "through wood conduction." Free standing walls as indicated above are constructed with 2 inch x 4 inch stud members. The warm side vapor barrier sheet of ALUMISEAL is sealed at all joints with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE and this vapor proof sheet is continuous from walls to ceiling and walls to floor forming a complete envelope. (See Note 1.)

Z Thirteen sheets of ALUMISEAL in walls and floors with $\frac{1}{4}$ inch air spaces between sheets takes up an overall thickness of only 9 $\frac{1}{4}$ inches. This construction is entirely adequate for minus 70°F to minus 100°F temperatures and is equivalent to approximately 17 inches of standard mass type insulation. Wood separator strips are reversed in direction to eliminate "through wood conduction" and all joints of the exterior vapor barrier sheet are positively and permanently sealed with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE. (See Note 1.)

NOTE 1

In all-weather rooms where the cycle of operating temperatures may run from minus 100°F to plus 165°F with high humidities injected at the higher temperatures, vapor proof envelope for containing these high humidities when required.

the exposed inside sheet of ALUMISEAL also has all joints completely sealed with ALUMISEAL LEAD-FACED VAPOR-PROOF TAPE to form a moisture proof and

SOME IMPORTANT ALUMISEAL INSTALLATIONS

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These values and the merchandisable assets to be enjoyed in its appearance—an appearance that inspires confidence and wins customers, are obtainable at no greater cost than bulkier and less efficient insulations.

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In all types of refrigerated construction ALUMISEAL stands up to its job. In freezers, coolers, hardening rooms, bulk storage, lockers, test rooms, altitude chambers, etc., and for laboratory use ALUMISEAL is meeting and surpassing performance requirements.

Your insulating job can be better with Alumiseal.

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... or write us today for full information applicable to your problems.

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U. S. PATENTS APPLIED FOR
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EAST HARTFORD, CONN.
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